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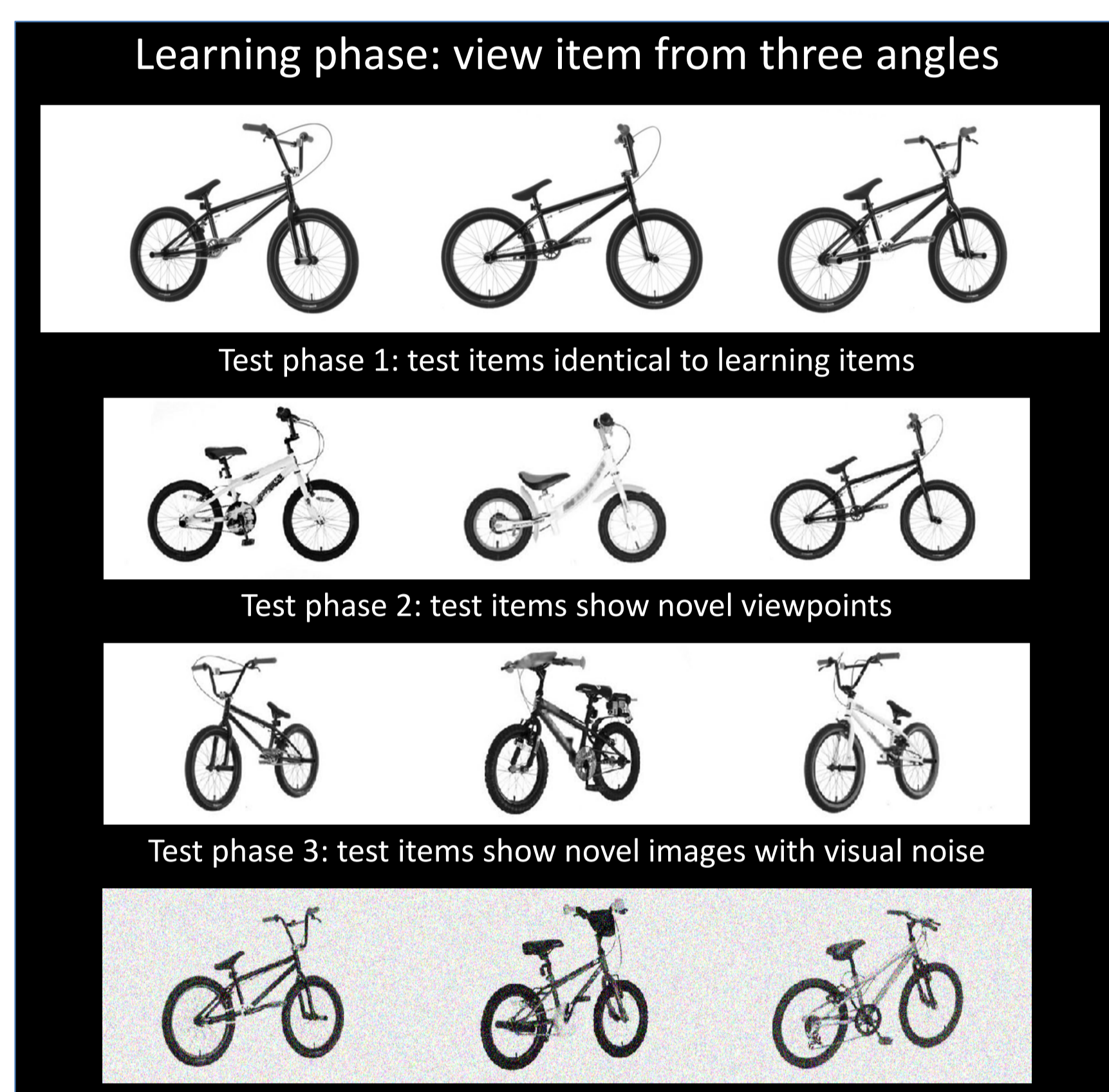
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## How does face recognition develop in childhood?

- Children are fairly poor at face recognition, but reach adult-like levels of performance around late adolescence<sup>1</sup>.
- Some research proposes that face-specific processing develops slowly throughout childhood<sup>2</sup>
  - Suggesting that face recognition matures at a different rate than general object processing
- Others suggests that face processing mechanisms are mature very early (before 5 yrs old) and subsequent improvements reflect general cognitive development<sup>1,3</sup>
  - Suggesting that face and object recognition should mature at a similar rate
- Recent evidence suggests that *face memory* may develop slowly, but *face perception* is mature relatively early<sup>4</sup>

**This study tested face and object matching and memory in children, to 1) examine how face and object processing develop in childhood; and 2) assess the psychometric properties of face and object processing tests in children**

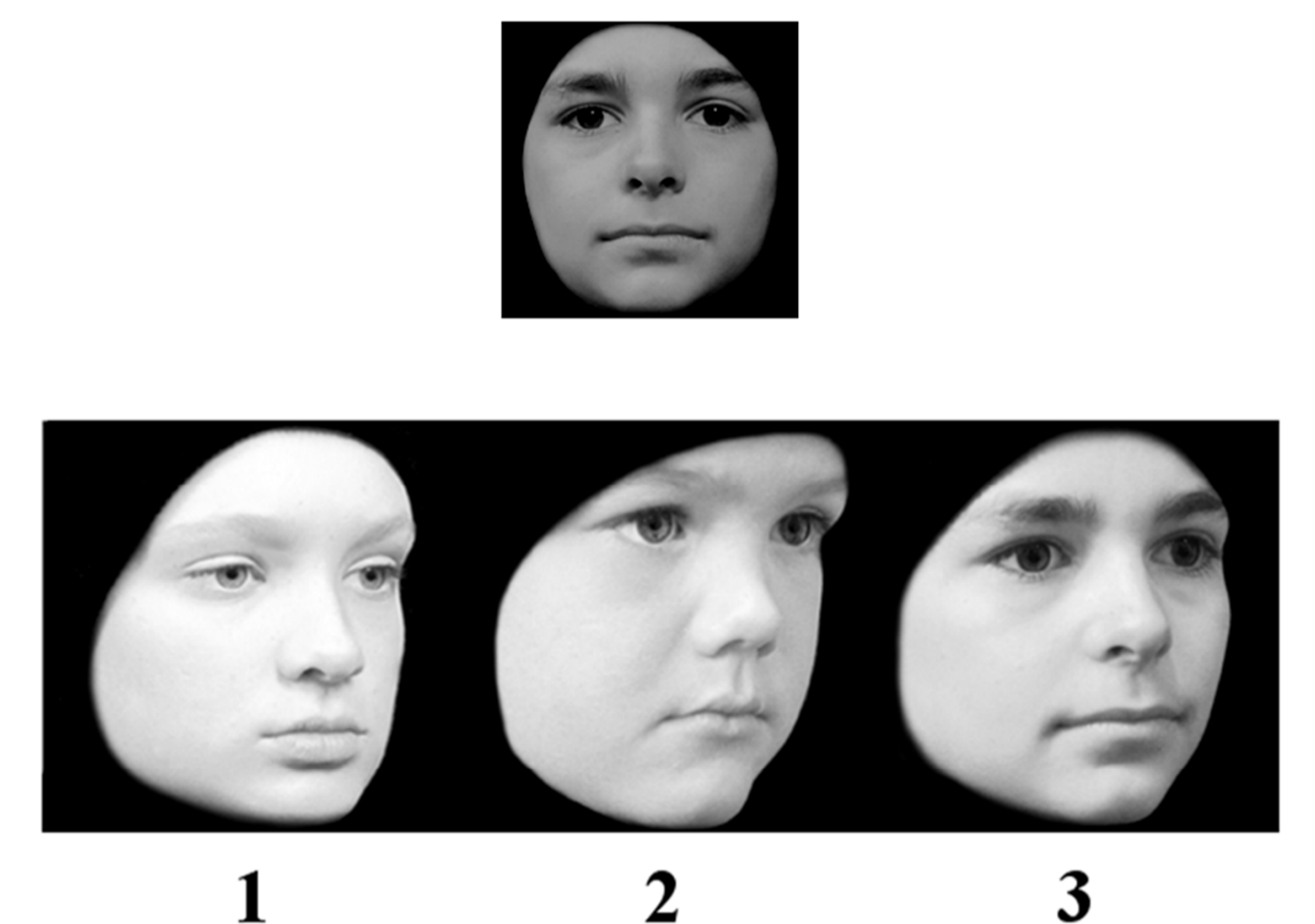
### Memory tests



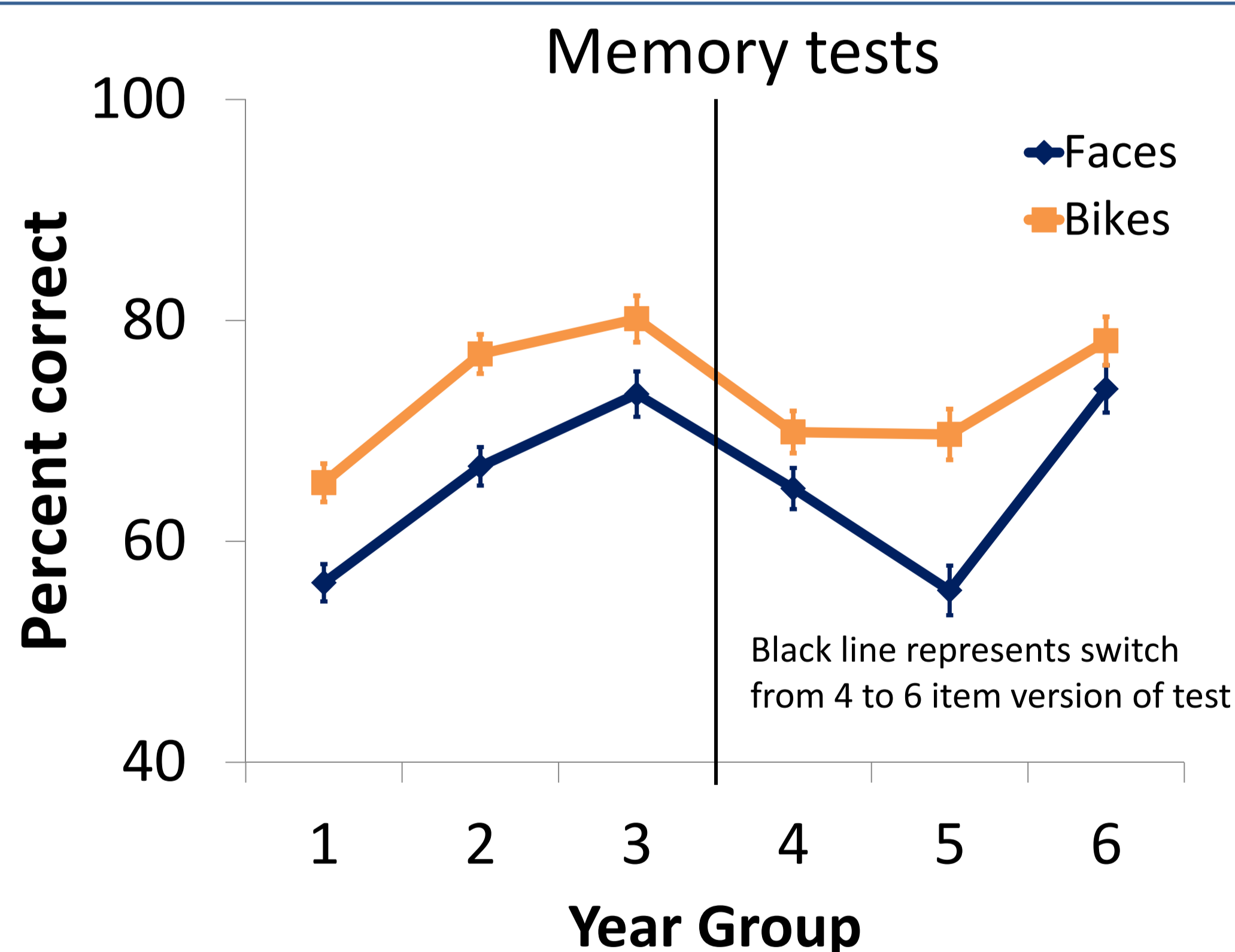
### Methods

- 668 UK primary school children in grades 1-6 (aged 5-11 yrs)
- 185 completed memory tests
- 483 completed matching tests
- Each child completed tasks with children's faces AND bikes, matched in format
- **Memory tests:** Cambridge Face Memory Test – kids (CFMT-K)<sup>5</sup>; and newly developed, matched format bike memory test
  - 4 items (48 trials) for young children (grades 1-3)
  - 6 items (72 trials) for older children (grades 4-6)
- **Matching tests:** 3AFC simultaneous matching tasks, stimuli from memory tests, 30 trials

### Matching tests



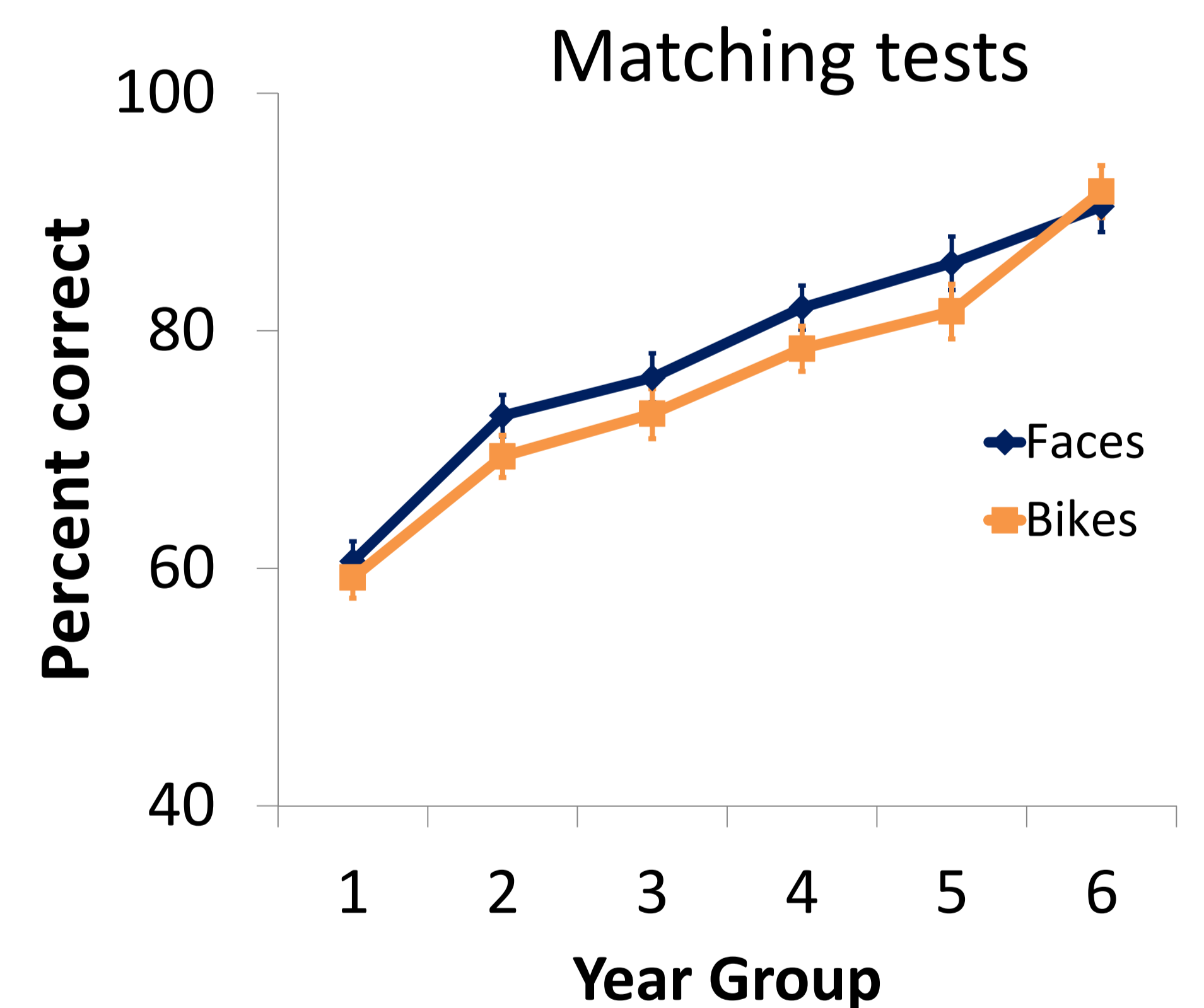
Match the top face to one of the bottom faces



**In young children:** each year accounts for 7.8% and 8.9% increase in face bike scores respectively  
**In older children:** each year accounts for 2.5% and 4.8% increase in bikes and faces, respectively

### Results

- Children get better at both faces and bikes tasks with age
  - **Memory:** effect of age,  $p < .0005$ ,  $\eta_p^2 = .17$
  - **Matching:** effect of age,  $p < .0005$ ,  $\eta_p^2 = .36$
- Face and bike processing improve at roughly the same rate
  - **Memory:** Age x Object,  $p = .810$
  - **Matching:** Age x Object,  $p = .626$
- All tests showed good psychometric properties
  - No floor or ceiling effects
  - High internal reliability
    - Cronbach's alpha  $> .80$  for all tests
  - Face and bike scores matched in middle age groups (year 3 and 4 students)



Each additional year accounts for 5.7% increase in face score and 5.9% increase in bike score

### Conclusions

**Face and object processing improve at a similar rate between 5 and 11 yrs old**

- Regardless of whether memory or matching tasks are used
- This supports the idea that face processing develops early, and later improvements reflect general cognitive changes (e.g., ability to pay attention and follow instructions, development of general memory)

**It is still unclear how well lab test results relate to real-world face recognition in children**

- Do these results correlate with familiar face recognition?
- Given the high reliability of these tests, can they be used to detect face recognition deficits in children?
  - e.g., prosopagnosia, face recognition problems in ASD